



Sea Grant

S.C. Sea Grant Consortium

Stormwater Pond

**Research and Management Collaborative
Stormwater Pond Conference Oct. 22, 2015**

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Outline

Background/ Why Have a Collaborative?

What is the Collaborative?

What are the Goals?

Current Activities

Next Steps



Background – Stormwater Ponds

- **Most common BMP for controlling runoff from developed areas in coastal SC**
- **Not a natural feature of the landscape**
- **Usually intended for *water quantity* control to minimize local flooding**
- **Often expected to control *water quality* impact to receiving waters via retention of sediments**



Background - Other Benefits

- **Aesthetic Amenities & Recreational Opportunities**
- **Irrigation**
- **Property Value**
- **Wildlife Habitat**



Information Gaps & Questions

➤ Effectiveness

➤ Pond design

➤ Design criteria

➤ Long-term functionality

➤ Maintenance



Flooding, Charleston Oct 2015



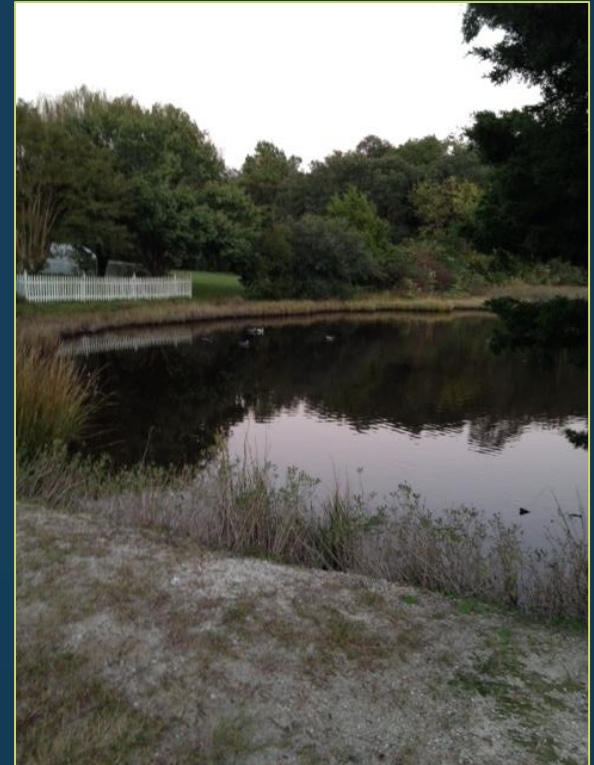
Slope Stability

Information Gaps & Questions

Surrounding Environment

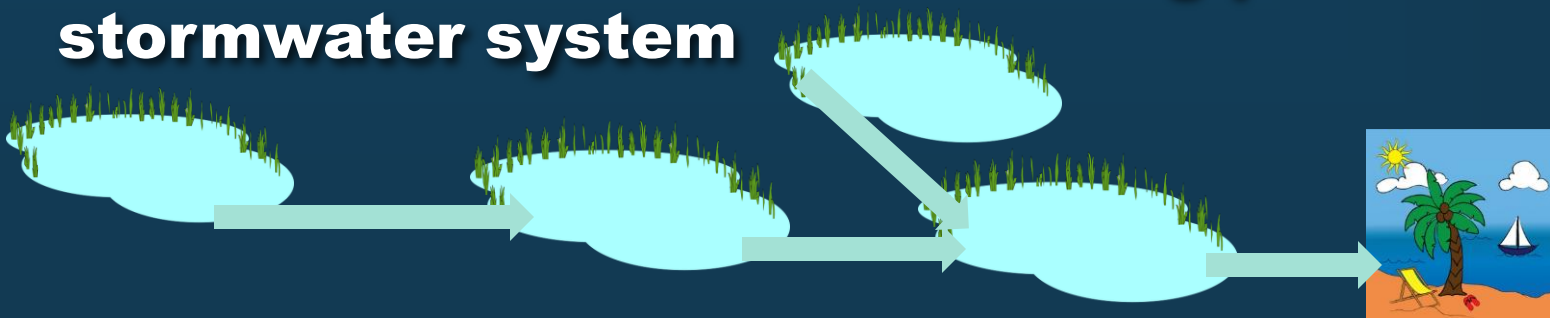
- **Potential impacts**
 - **Site specific conditions**
 - **Land use**

- **Hydrologic connection**
 - **Tidal areas**
 - **Groundwater**



Additional Considerations

- **Changing landscape**
 - **Increasing urbanization**
 - **Climate change & sea level rise**
- **Connectivity of ponds to other ponds & receiving waters**
 - **Individual site BMPs becoming part of stormwater system**



What is the Stormwater Pond Collaborative?

Partners- Multi-Institutional & Multi-Disciplinary

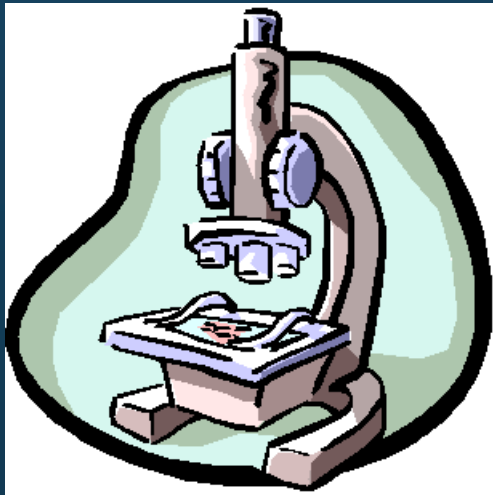
- **Technical Advisors & Researchers**
- **Stormwater Pond Advisory Council (SPAC)**
- **Sea Grant - Coastal Environmental Quality Program Coordinator**



What are the Goals?

➤ **Investigate and address information needs that can be used to improve overall knowledge and management of stormwater ponds**

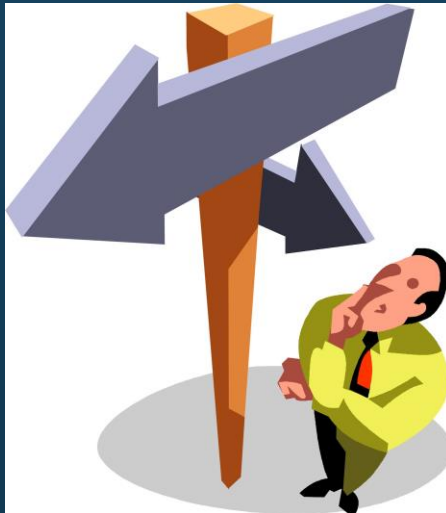
✓ **Technical Advisors & Researchers**



What are the Goals?

➤ **Work with stormwater constituencies to understand information needs and extend relevant science-based information**

✓ **Stormwater Pond Advisory Council**



Goals - Stormwater Pond Advisory Council

➤ **Ensure direction, activities, and products are relevant and address needs of various audiences**

✓ **stormwater managers, consultants, practitioners, realtors, government, scientists, outreach specialists**



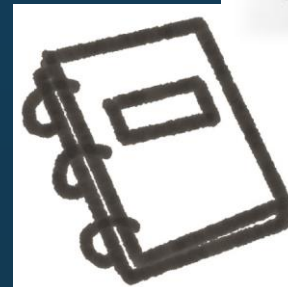
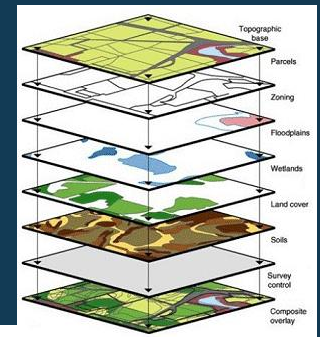
Current Activities

Nearing completion - series of Sea Grant supported studies generating 3 products.

1. Stormwater Pond Inventory and Classification

2. Public Awareness/ Messaging

3. State-of-Knowledge Report



“Science Serving South Carolina’s Coast”

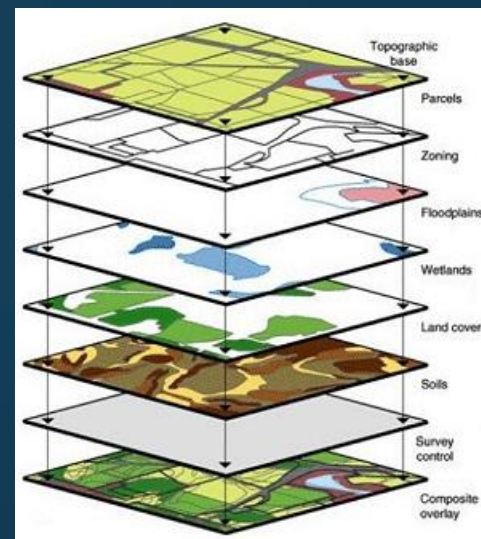


Current Activities – Pond Inventory

"A Stormwater Pond Inventory for the Eight Coastal Counties of South Carolina"

**Project Team: USC Erik Smith, Ph.D.
SCDNR Denise Sanger, Ph.D.**

- **Create geospatial inventory (2013 imagery)**
- **Develop pond classification**
- **Conduct change analyses (1994 to 2013)**



Current Activities – Messaging Strategy

"Development of a Strategic Outreach Plan to Improve Long-Term Stormwater Pond Awareness and Maintenance"

Project Team: Clemson

Katie Buckley, M.S. Amy Scaroni, Ph.D.

Melinda Weathers, Ph.D. Guinn Garrett Wallover, M.S.

- **Develop Outreach Products & Strategic Plan**
- **Recognize multiple audiences - focus on specific & sustainable actions, common message**
- **Based on diverse inputs - surveys, research, interviews, and focus groups**



"Science Serving South Carolina's Coast"

Current Activities- State of Knowledge Report

Report available early 2016

Chapter Outline

Executive Summary

Background

Pond Classification/ Change Analyses

Hydrology and Pond Design

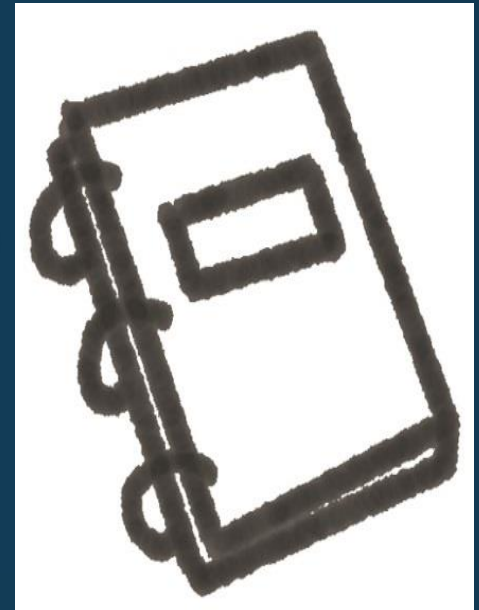
Non-Point Source Contaminants

Ecosystem Function

Policy, Regulation, and Management

Management Approaches and Cost

Public Perception/ Outreach



Current Activities- Hydrology & Pond Design

Title: "Sources, Fate and Transport of Contaminants in Engineered Stormwater Structures"

**Project Team: College of Charleston
Vijay Vulava, Ph.D. Barbara Beckingham, Ph.D.
Timothy Callahan, Ph.D.**

- **Review different pond designs**
- **Describe role of hydrology for contaminant transport**
- **Identify geochemical processes & sediment in contaminant fate**



Current Activities- Non-Point Contaminants

Title: "Non-Point Source Contamination in Stormwater Systems in South Carolina"

**Project Team: University South Carolina
Mohammed Baalousha, Ph.D. Samantha McNeal,
Geoffery Scott, Ph.D.**

➤ **Contaminants and Sources:**
nutrients, metals, organics,
bacterial, emerging

➤ **Contaminant Risk Assessment:**
sediment and water quality,
bioaccumulation,
ecosystem services



Current Activities- Ecosystem Function

Title: "Ecological Function within the Coastal Landscape"

**Project Team: USC Dianne Greenfield, Ph.D. Erik Smith, Ph.D.
SCDNR Andrew Tweel, Ph.D. Denise Sanger, Ph.D.**

- **Physical & biogeochemical processes**
- **Modulating environmental factors: temperature, salinity**
- **Vegetation**
- **Fauna**



Current Activities- Policy & Regulation

Title: "An Assessment of Stormwater Policy, Regulation, and Management for the Coastal Counties of South Carolina"

Project Team: Clemson

Jeff Allen, Ph.D. Lori Dickes, Ph.D

Donna London, Ph.D. Katie Buckley, M.S.

➤ **Reviews and Focus Group**

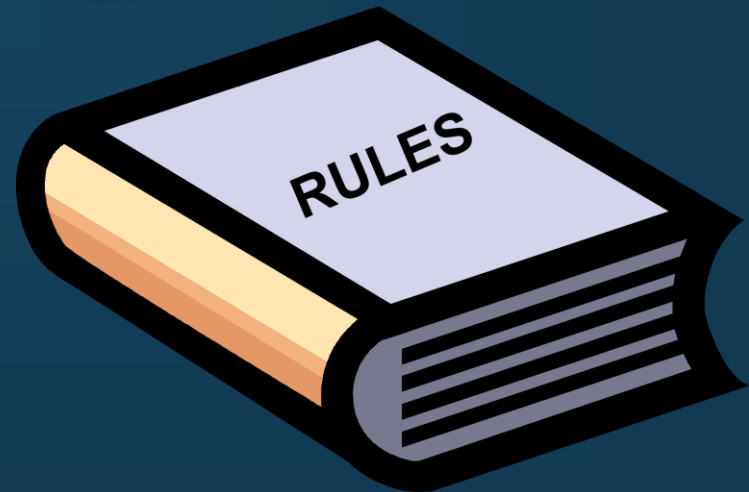
➤ **Laws and Programs**

Federal

State

County

Municipal



Current Activities - Management & Costs

Title: "Pond Management Approaches and Costs: An Economic State-of-the-Knowledge Review and Synthesis"

**Project Team: College of Charleston
Chris Mothorpe, Ph.D. Wesley Burnett, Ph.D.**

- **Surveys and reviews**
- **Population growth & stormwater**
- **Pond ownership & BMP**
- **Economic frameworks**
- **Estimating maintenance costs**



What's Next?

- **Finalize Report & Communicate Results**
- **Solicit Feedback**
- **Develop Products**
- **Prioritize and Address Needs**
 - Short term - Implementation**
 - Longer term - More work**



What's Next?

- **Establish Additional Funding**
- **Extend Scope and Partners**
Statewide
Regional



Questions

"Science Serving South Carolina's Coast"

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